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August 30, 2012

Dr. Greg Costanzo  
Stahl Exotic Animal Veterinary Services  
4015 Rust Road  
Fairfax VA, 22030

Dear Dr. Costanzo:

Thank you for the opportunity to consult with you on this business venture regarding the use of Antler as a nutritional supplement and chewing device for dogs. We have sent 18 grams of the 120 gram piece of antler for analysis of moisture, protein, fat, ash, calcium, phosphorus, magnesium, potassium, sodium and trace minerals. The amount of trace minerals consumed would be minimal, therefore little will be said about these in relationship to dietary supplementation as this product would be primarily considered as a protein, calcium and phosphorus supplement with some nuances to electrolytes during specific disease processes. The following discussion will be broken down into its use as a nutritional supplement for calcium and phosphorus for utilization in home-cooked or imbalanced rations and then as a chewing device that has the potential to be consumed excessively.

Supplement:

In preparing the antler into a meal we used a dremel tool to liberate a granular consistency. This was not a fine powder and depending on the fineness of grind the amount that will be measurable as a teaspoon unit will differ. Our teaspoon averaged approximately 2.1 grams and will be reported as such in the calculations presented. When utilizing this product as a calcium and phosphorus supplement to dogs and cats we have based the need of supplementation on the amount of calories consumed. Whether a complete meat based diet or a typical 20% ME protein, 50% ME carbohydrate and 30% ME fat diet, the supplementation required to meet AAFCO and the NRC recommendations for a complete and balanced diet for either scenario would be approximately 10 grams of antler meal per 1000 kcals for adult dogs. This would work towards a recommendation of approximately 1 teaspoon per 200 kcals consumed which should be mixed thoroughly into the meals provided. This would provide approximately 2.0 grams of calcium and 1.82 grams of phosphorus in the meat based diet per 1000 kcals; and approximately 1.9 grams and 1.6 grams per 1000 kcals when providing a mixed substrate (meat, carb and fat) diet. These recommendations would be ideal for adult dogs as AAFCO states that minimally 1.7 grams calcium and 1.4 grams phosphorus is in a diet per 1000 kcals. For adult cats the requirement is approximately 2.0 grams calcium and 1.5 grams of phosphorus therefore a teaspoon per 200 kcals will be sufficient for adult cats, but 1.5 teaspoons may be a better recommendation since it will definitely be higher than the AAFCO recommendations.

Since puppies and kittens have higher requirements more of this supplement would have to be utilized in the diet (1.5 teaspoons per 200 kcals of diet) , however we strongly discourage the use of home-prepared diets for puppies and feel that labeling of this supplemental meal for puppies would be remiss. This is due to the complications associated with excessive calcium consumption and developmental orthopedic diseases in large and giant breed puppies.

Chew Device:

Although many veterinary dentists do not recommend the use of bone-like dentifrices it is still common practice, and the constitution of antler appears to be very close to bone, however, the amount of calcium and phosphorus is slightly lower which may be due to the large amount of cancellous bone within the antler. That said the use of such product will deliver the amounts of nutrients listed below in a single 120 gram antler segment as supplied to us for analysis.

consumed	protein	fat	ash	calcium	phos.	mag.	potass.	sodium
120 grams portion	53 g	0.012 g	57 g	19.8 g	9.6 g	0.42 g	0.18 g	0.78 g

Based on this analysis if a dog were to consume an entire portion they would receive approximately 20 grams of calcium and 10 grams of phosphorus. In a typical daily ration of 1000 kcals for a 20 kg dog it would be expected that that a dog would consume approximately 2.5-6 grams of calcium and 2-5 grams of phosphorus a day in a typical dry or wet diet. Consumption of an entire antler daily would increase calcium and phosphorus intake by approximately 3-4 fold. Therefore, recommendations regarding its utilization should be limited to approximately 1 antler piece per week in small dogs, 1-2 per week in medium breed dogs and 2-3 per week in large and giant breed dogs. Additionally the very high calcium intake associated with consumption precludes its utilization in large and giant breed dogs under a year of age, and medium breed dogs less than 6 months of age due to excessive calcium consumption. Furthermore if dogs with medical conditions requiring protein and sodium restriction partake in consumption of this product by consuming more than one per day it may significantly increase dietary sodium and protein intake, particularly for smaller dogs (under 20 kg) consuming an entire antler piece per day. These recommendations are merely guidelines to responsible use of this dentifrice ,and may be appropriate labeling information to minimize potential problems associated with consumption of such materials.

If you have any further questions please feel free to contact me at [jw37@cornell.edu](mailto:jw37@cornell.edu) or 607 253-4389.

Regards,



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